

WHAT IS CLAIMED IS:

1. A method, comprising the steps of:
providing a window which is transmissive to
radiation having a predetermined wavelength;
providing a frame which has an opening therethrough;
providing an annular sealing section between and in
contact with each of said window and said frame, said
sealing section extending completely around said opening;
heating said window, said frame and said sealing
section to a selected temperature at which said sealing
section has melted, said selected temperature being lower
than melting temperatures of said frame and said window;
and
thereafter cooling said window, said frame and said
sealing section until said sealing section has solidified
and formed between said window and said frame a hermetic
seal which extends completely around said opening.

2. A method according to Claim 1, wherein said step
of providing said frame includes the steps of:
using a metal to make said frame; and
oxidizing a surface portion of said metal frame
which will be engaged by said sealing section.

3. A method according to Claim 2, wherein said step
of providing said frame includes the step of selecting an
ASTM F15 steel material for use as said frame.

4. A method according to Claim 2, wherein said
oxidizing step includes the step of placing said frame in
a wet nitrogen furnace while heating said frame.

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5 5. A method according to Claim 4, wherein said step of heating said frame within said furnace is carried out by heating said frame to a peak temperature in the range of approximately 975°C to 1005°C for a time period in the range of approximately 9 to 13 minutes.

10 6. A method according to Claim 4, including prior to said oxidizing step the step of placing said frame in a wet hydrogen furnace while heating said frame.

15 7. A method according to Claim 6, wherein said step of heating said frame within said wet hydrogen furnace is carried out by heating said frame to a peak temperature of approximately 1050°C for a time period in the range of approximately 11 to 15 minutes.

20 8. A method according to Claim 1, including the step of selecting for use as said window a material which includes a borosilicate glass.

25 9. A method according to Claim 1, wherein said step of providing said window includes the step of forming an antireflective coating on a side of said window that will face said frame and be in contact with said sealing section.

30 10. A method according to Claim 9, wherein said antireflective coating is one of silicon oxide and magnesium fluoride.

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1. The first step is to identify the problem. This involves understanding the current situation and what needs to be improved.

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15. An apparatus, comprising:
a window which is transmissive to radiation having a
predetermined wavelength;

5 a frame which has an opening therethrough; and
an annular sealing section which is disposed between
and fixedly bonds said window to said frame, said sealing
section extending completely around said opening and
providing a hermetic seal between said window and said
frame at all locations therealong, and said sealing
10 section being configured to melt at a temperature which
is lower than melting temperatures of said frame and said
window.

16. An apparatus according to Claim 15,
15 wherein said frame is made of a metal, and
wherein said sealing section contacts a surface
portion of said frame which has been oxidized in a wet
nitrogen atmosphere.

20 17. An apparatus according to Claim 16, wherein
said frame is made of an ASTM F15 steel material.

18. An apparatus according to Claim 15, wherein
said window includes a borosilicate glass.

25 19. An apparatus according to Claim 15, wherein
said window has on a side thereof facing said frame an
antireflective coating, said sealing section engaging
said antireflective coating.

20. An apparatus according to Claim 19, wherein
said antireflective coating is one of silicon oxide and
magnesium fluoride.

21. An apparatus according to Claim 15, wherein
said sealing section includes a glass material.

22. An apparatus according to Claim 15, wherein
said sealing section includes first and second glass
materials which are different, said first glass material
being an annular portion of said sealing section which
extends around said opening of said frame in contact with
said window and spaced from said frame, said second glass
material being an annular portion of said sealing section
which extends around said opening of said frame in
contact with said frame and spaced from said window, and
said first and second glass materials being in contact
with each other between said window and frame.

23. An apparatus according to Claim 22, wherein
said sealing section includes a third glass material
which is different from each of said first and second
glass materials, and which is an annular portion of said
sealing section that extends around said opening of said
frame in contact with each of said frame and said window,
said third glass material being disposed on a side of
each of said first and second glass materials nearest
said opening in said frame.

24. An apparatus according to Claim 23, wherein
said sealing section includes a fourth glass material
which is different from each of said first and second
glass materials, and which is an annular portion of said
sealing section that extends around said opening of said
frame in contact with each of said frame and said window,
said fourth glass material being disposed on a side of
each of said first and second glass materials remote from
said opening in said frame.

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